



Optimizing the control of foot-and-mouth disease in Denmark by simulation

Influence of livestock markets on spread of FMD

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Optimizing the control of foot-and-mouth disease in Denmark by simulation

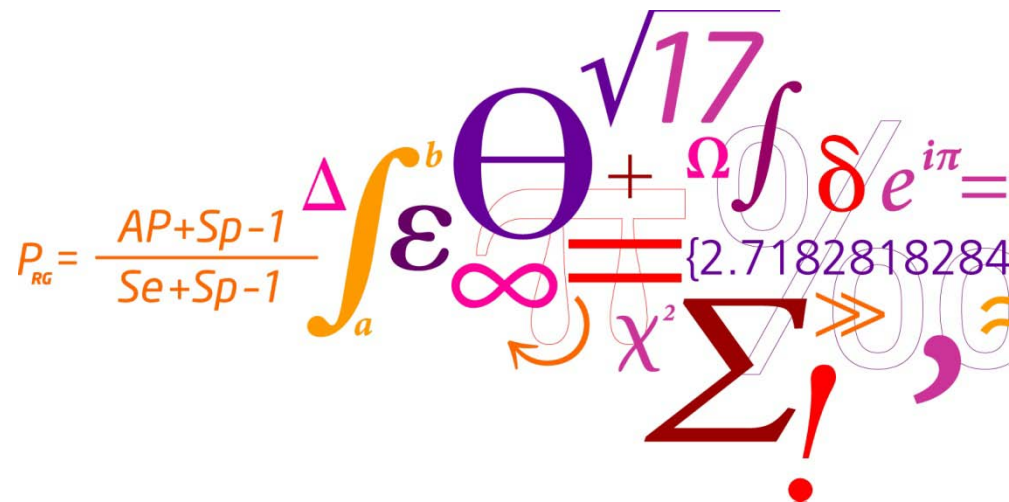
Influence of livestock markets on spread of FMD

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$$P_{RG} = \frac{AP+Sp-1}{Se+Sp-1} \int_a^b \varepsilon \Theta^{\sqrt{17}} + \Omega \int \delta e^{i\pi} = \{2.7182818284\}$$



Materials and method

- Simulated in ISP, basic scenario
- Only start in **cattle** herds
- Extra
 - Movements to markets per herd (daily probability)
 - Recieving from markets (yes/no)
- Starting in 386 herds
 - highest prob. of moving to market
 - Each index run 100 times
- Same without markets



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Materials and method

- Extra contacts
 - 3.5
- Probability of transmission
 - normal distribution $\mu=0.415$, $sd=0.06$.
 - Purchased animals
 - Indirect contact from visitors
- Closed at first detection
 - HRP only = 21 days

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Epidemiologic results - Markets

Simulated scenario	Epidemic duration (days ¹)	Number of detected herds	Number of depopulated herds	Size of infected area (1000 km ²)
With markets	90 (9-262)	161 (4-631)	194 (5-754)	14.3 (0-37.5)
Without markets	87 (8-262)	144 (3-612)	173 (4-731)	9.8 (0-35.6)

Economics



Epidemiologic results - Markets

Simulated scenario median (5-95%)	Direct costs (10 ⁶ €)	Export losses (10 ⁶ €)	Total costs and losses (10 ⁶ €)
With markets	37.5 (6.8-126.7)	629.6 (375.7-1166.7)	670.9 (382.6-1284.5)
Without markets	33.9 (6.5-124.7)	613.8 (370.5-1161.8)	651.6 (377.4-1277.8)

Conclusions

- With markets
 - Longer, larger and more costly epidemics
- This is with a highly contagious disease
 - Less contagious diseases
 - Are not spread as quickly
 - BUT can spread silently in longer periods
 - Might not lead to closure of markets

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Thank you for your attention

